



828—PAGE 13.

[Form 35]

Fourth Edition.

"I must express to you my great satisfaction with the style and finish of your work. This is not always the case with our American School Apparatus."

PROF. F. H. SMITH, UNIV. OF VA.

INFLUENCE MACHINE.

SURGICAL

AND

EDUCATIONAL.

L. E. KNOTT APPARATUS COMPANY,

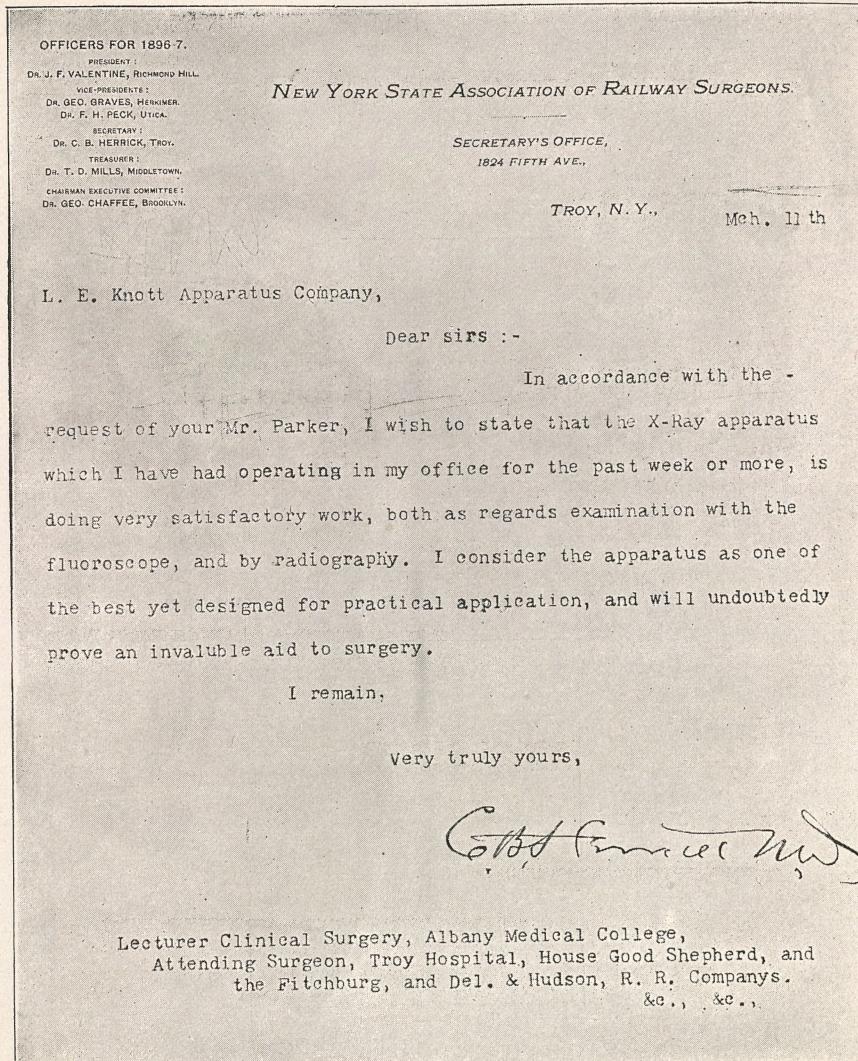
(Incorporated.)

*Scientific Supplies.**Microscopic and Chemical Apparatus,**The National Physics Apparatus.*

14 ASHBURTON PLACE,

BOSTON.

AGENTS WANTED.



INFLUENCE MACHINE.

The use of a practical X ray outfit has now passed beyond the field of quackery. The medical profession, rightly conservative, have been watching with intense interest the kaleidoscopic changes in the application of the newly discovered power. As new occasions have arisen to test the practicability of the apparatus in alleviating human suffering, the need for a thoroughly reliable and mechanically perfect generator has become more apparent. As the possible field of usefulness has been broadened and the conditions to be met become more varied, investigators have strenuously endeavored to devise a generator which should keep pace with these demands.

During certain stages of the development, great power was the attribute most to be desired, as only by this means is it possible to obtain, IN BRIEF TIME, good results through thick portions of the body. To meet these conditions the High Frequency Coil was developed, and it stands today as the only practical means of obtaining the results above referred to. This coil, as will be remembered from the third edition of our X Ray circular, is made to be attached directly to the incandescent lamp socket, its action being controlled entirely by one switch. The results obtained with this outfit have been most flattering. The few failures to obtain good results, reported by a few manufacturers, have, we believe, in every case been caused by trying to produce an instrument with less expenditure of material and labor, and the uniform discharge given by our spark wheel air-blast being ignored. Furthermore, we alone have adopted the High Frequency Coil to direct incandescent lighting currents. Where the incandescent current is available, no more powerful or efficient X ray generator can be obtained.

The conditions among many who would employ this instrument rendered any device requiring the use of the dynamic current entirely beyond their reach. Furthermore, it was found by many that extremely short exposures were not an absolute necessity, and, if certain other advantages could be obtained, they could well afford to sacrifice this requirement.

Thus, once more our attention was called to the induction coil as a means of exciting a tube, but our results were less encouraging than in earlier experiments in this same line, as, since then, we had become accustomed to the high-grade results obtained with the High

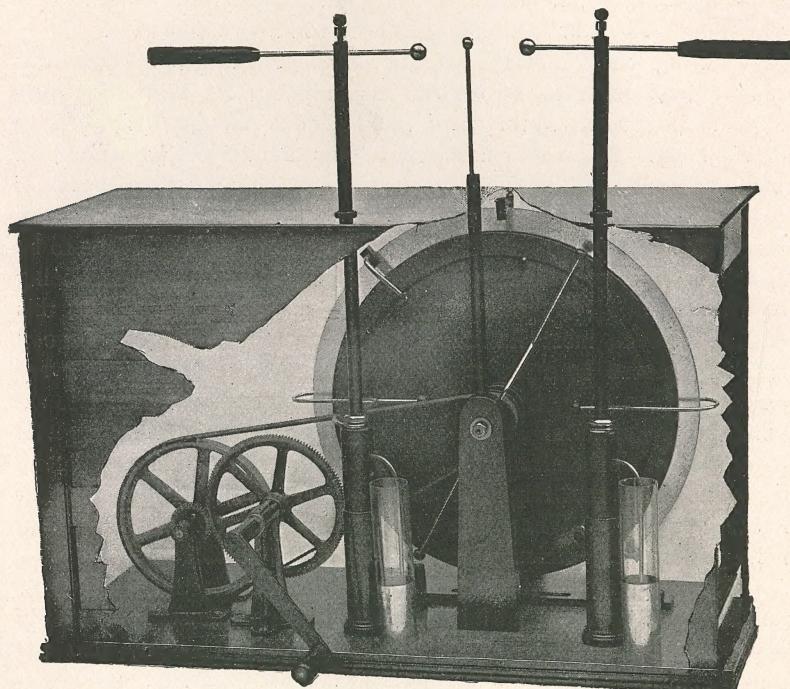
Present
Need.

Coils.

Influence
Machine.

The X Ray Apparatus manufactured by the L. E. Knott Apparatus Co. is mechanically and scientifically perfect.

Frequency Coil. At a recent meeting of the British Association, Dr. Trouton read a paper on "The Duration of X-Radiation at Each Spark." He found the duration to be sometimes only 1-10,000th of a second, sometimes as long as 1-800th of a second. Prof. J. J. Thompson remarked that radiation so brief showed how inefficient was a spark coil as an instrument for producing it, since the period of the spark was so much longer than the period of the radiation." This brought us once more to consider the Influence Machine as a means of excitation. Thus were opened the consideration of many mechanical and scientific problems which must be worked out through a series of long and careful tests.



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THE TROY DAILY PRESS. TUESDAY, MARCH 2, 1897.
NEW AGENT IN SURGERY.—SUCCESSFUL DEMONSTRATION OF THE VALUE OF
X-RAYS.

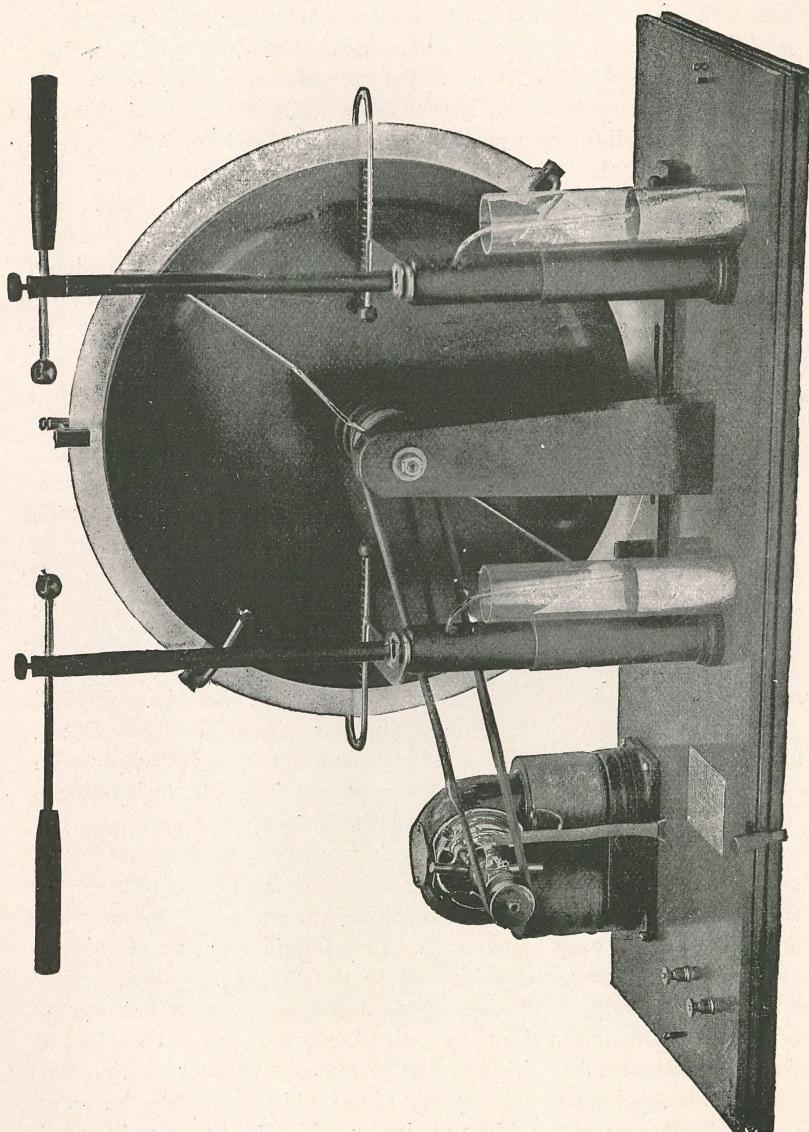
A practical demonstration of the value of X-Rays in surgery was given last evening at Dr. C. B. Herrick's office by N. D. Parker of Boston on the Knott Improved Static Machine. A few doctors and scientists were present, and were perfectly amazed at the clearness and definition with which the bones of the body were seen with the Fluoroscope.

One who has worked even with the cruder form of Influence Machine cannot but see at a glance that the character of discharge, if sufficiently rapid, is such as to produce good results. This, then, necessitates rapid generation, to secure which there must be no loss of power. All parts of such a machine must be mechanically perfect. All adjusting parts must be reduced to the simplest form. Requirements.

The adjustment must be easily made and perfectly secure. The rotating plates must either be made of some material which will stand very high speed or they must be duplicated to a cumbersome extent. Simplicity of adjustment and ease of working seem to have rendered the first the more practical. These plates must, then, be made of such material that they will stand *enormously* high speed. They must be so prepared that they will not warp or that a conducting surface will not form upon them. If the speed is obtained with hand power, it is of the utmost importance that the greatest mechanical experience and skill be employed, as a slight error in judgment as to the best arrangement of belt or gear will prove fatal to the ease and convenience of its operation. The question of a bearing is also one which should have the greatest consideration. It has been found that a form of bearing well suited to ordinary work will not stand the peculiar demands here entailed. If such a machine is to meet its requirements, it must be ready to operate at all times and under all atmospheric conditions. This means that the entire operating parts must be securely shielded from the outside air. Openings through the cabinet must be as few and well protected as possible. The gearing itself, if such be used, should likewise be on the inside of the cabinet, as the openings through which the belt passes will furnish a constant supply of moist air during the period in which the machine is operated.

The instrument shown on page 4 is a result of a long series of tests, in which each of the foregoing points have been carefully considered. We have produced a machine containing a small number of parts, insuring easy adjustment. The bearing is specially made for this peculiar work, and subjected to the most severe tests. The vulcanized plates are specially prepared to prevent warping, and to insure a continuance of the non-conducting properties. The glass is of Scotch manufacture, with a prepared surface to prevent the condensation of moisture. The gears are machine cut, only the most improved gear-cutting machinery being used. The base, as is noted in the cut on page 6, is low and broad, bringing the centre of gravity to a point which insures the greatest stability. The wood

Agents wanted.



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ATTICA, March 3, 1897.

The Static is working very nicely. You have the finest Static on the market.
Yours truly, W. B. GIFFORD, M. D.

work is made of well-seasoned mahogany, which will stand the climatic changes without warping or shrinking. The cabinet is made with panelled sides and glass ends, with a highly polished surface. As will be noted in the cut, nearly all of the metal conductors are carefully protected with heavy vulcanite insulations; all of the exposed metal is carefully nickelled and burnished. So much care is taken in the adjustment of the various parts that no loss can occur.

The time has now arrived when, for the welfare of its people, every community should demand access to a complete X-ray outfit. Considering that every educational institution, secondary or higher grade, should give much attention to this work in connection with the study of electricity, would it not be well for every school board, in the smaller communities, at least, to purchase such an outfit, with the understanding that all the local physicians may have the use of it by paying a nominal charge or by paying for the services of the instructor who would doubtless be called upon to assist in the work?

In the producing of an efficient Influence Machine, the first consideration is the volume of current which the machine is capable of generating. Having obtained, then, a machine with great possibilities in this particular, it is only a matter of adjustment to obtain the required frequency and length of discharge best suited to this particular work.

In the machine which we are making, this has been worked out so carefully that we are able to obtain a rapidity of discharge which is practically continuous. Its ability to excite an X-Ray tube strongly cannot be denied. The reproduction found on page 16 is only a crude representation of what can easily be accomplished with this outfit. All who are familiar with the process of producing these cuts from photographs know that much of the detail is lost in the operation, while in the original plate it is possible to distinguish clearly the heart, fur, cartilage connecting the ribs, the position of the diaphragm, spleen, main canal, and, in fact, nearly the entire anatomy. Such a plate would prove of absorbing interest to students in Zoölogy, and would be of great educational value in understanding the true relation existing between the parts in their normal condition. We do not consider this an unusual result to obtain with this outfit, as we believe any one with a reasonable amount of care can produce equally good.

While this machine, as originally designed, was intended for those who wished to operate it with hand power, we have made a

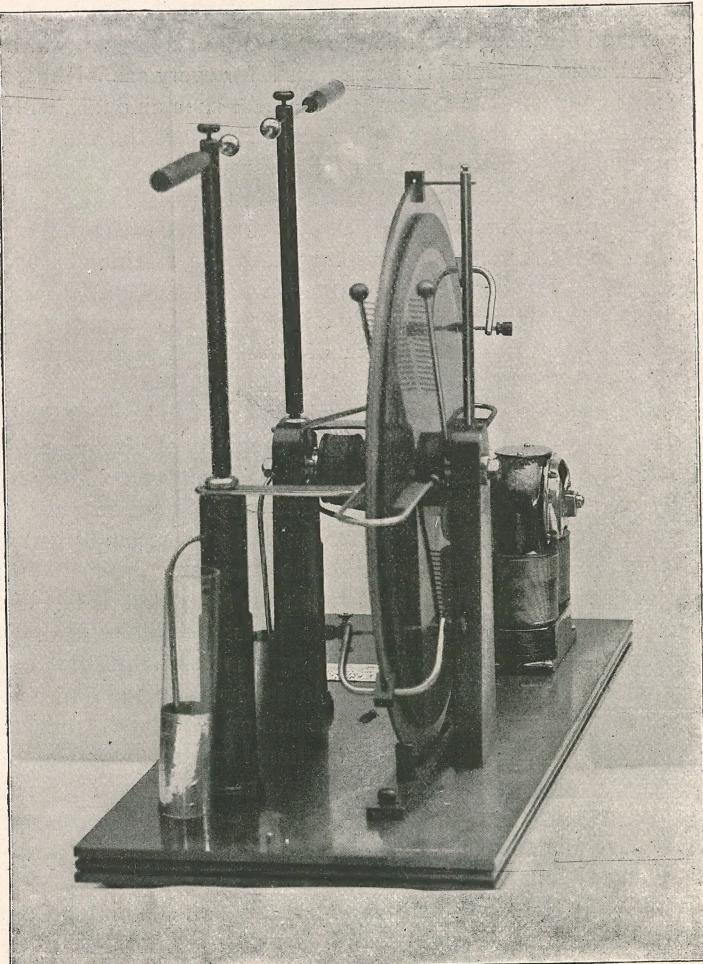
Practical and
Educational
Use.

Efficiency.

Motive Power.

We are much pleased to answer inquiries and give information regarding manipulation.

provision in the plan and design of the cabinet to allow the instrument to be operated either with a direct or alternating current motor or water motor. Whatever be the form of motive power, it can be placed on the inside of the cabinet, which obviates the necessity of belting through, a point of greatest moment in the practical working of an Influence Machine. The cut on page 6 shows the instrument as furnished with a direct current motor. The motor here used is specially wound, so that any required speed can easily be obtained. The workmanship is of the very highest quality.



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BUFFALO, N. Y., Nov 29, 1896.

The Crookes tubes which you sent me seem particularly well adapted for my coil (Ruhmkorff), and give better results than any I have ever obtained before and I have used many tubes made by manufacturers both in this country and in Europe.

Yours truly,

E. B. STEVENS.

In the matter of alternating current motors, we have here made much improvement in the designs heretofore on the market. As is well known, there has not been offered for sale a really practical low power alternating current motor. We are, however, prepared to furnish such an instrument of fine workmanship and thoroughly practical in every particular.

When the machine is desired to operate with a water motor, we furnish special connections for attaching it to a faucet, so that little or no trouble will be experienced in setting the instrument up.

To summarize the points which we have obtained in an unusual degree in the machine we are now putting out:—

First. Rapid generation, with very slight percentage of loss in mechanical power.

Second. Generating-plates which will permit high speed.

Third. Generating-plates not liable to warp.

Fourth. Generating-plates so prepared that a conducting surface will not form upon them.

Fifth. A cabinet so constructed that the whole instrument is efficiently protected from moisture and dust.

Sixth. Easy and secure adjustment of working parts.

Seventh. Greater portability than any other form of X-Ray machine.

Eighth. Special construction for a current in one direction only.

Ninth. Ability to give great rapidity of discharge.

Tenth. The ability to excite X-Ray Tubes powerfully, and produce *great penetration* without any apparent injury to the tube itself.

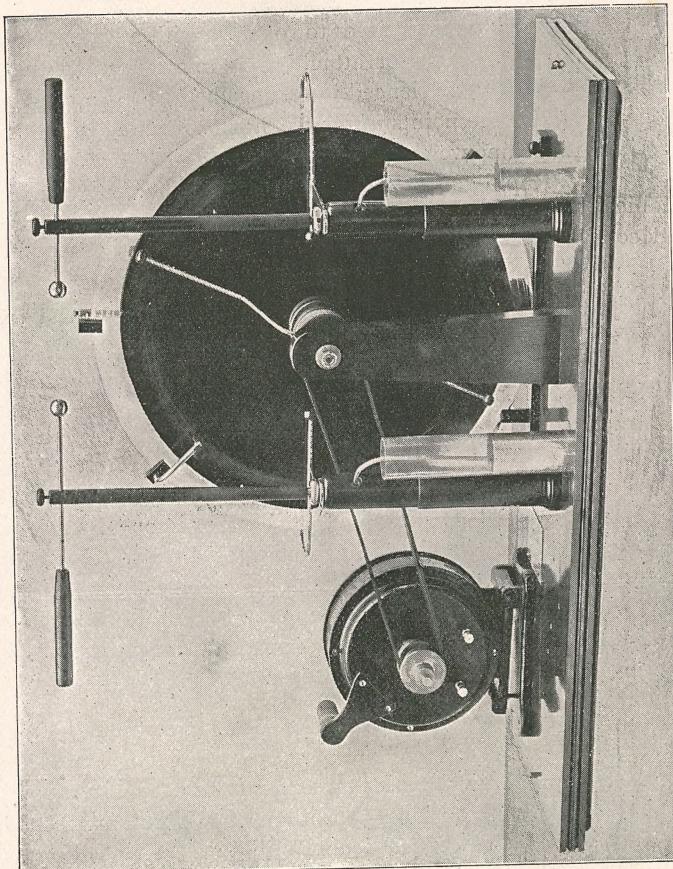
Eleventh. Easy adaptability to various forms of power.

X-Ray Tubes.

We have spared no energy in endeavoring to continually improve the quality of X-Ray Tubes on the market. Our long experience in this work has taught us the desirable qualities which a good tube should have; also the various conditions for different methods of excitation. Our double reflector tubes still hold their position as the finest tube on the market for High Frequency currents. Tubes especially adapted for the Induction Coil have also merited our closest attention, and we are now able to furnish a tube specially pumped for any given length of coil which our customer is using.

Since the development of the Influence Machine, we have given great consideration to the tubes especially designed for it. Here we are able to guarantee the very highest penetrating power, combined with great detail and permanency of vacuum.

X-Ray Tubes for any kind of Generators.



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WESTERN UNION TELEGRAPH COMPANY,
TACOMA, WASHINGTON, Dec. 1, 1896.

I am having great success with the screen.

Yours truly,

JAS. L. McDONNELL.

PRICE LIST.

In our previous circular, third edition, we offer prices of general X Ray apparatus.

Goods shipped promptly.

Prices subject to change without notice.

We pack with great care in specially constructed cases.

821. L. E. Knott Apparatus Co.'s High Grade Influence Machine, including the hand power and mahogany cabinet, illustrated on page 4. Price \$75.00

822. L. E. Knott Apparatus Co.'s High Grade Influence Machine, including direct current electric motor and mahogany cabinet, illustrated on page 6. Price \$105.00

Note.—Customers will kindly state voltage of the current on the line to which the motor is to be connected.

823. L. E. Knott Apparatus Co.'s High Grade Influence Machine, including alternating current motive power and mahogany cabinet, illustrated on page 10. Price \$115.00

Note.—Customers will please inform us for what voltage the motor will be required, and the number of cycles of the current. This latter may be obtained readily from the Electric Light Company.

824. L. E. Knott Apparatus Co.'s High Grade Influence Machine, with water motor and hose pipe for connection to the garden hose faucet, including cabinet. Price \$95.00

824a. Our new X Ray Tube, manufactured expressly for High Grade Influence Machine. Price \$8.00

825. Support, of a new model for adjusting the tube to its most convenient position for use, made of French polished mahogany throughout. This stand, devised by Dr. A. H. Hoyt of Penacook, N. H., we believe to be the most serviceable type we have seen. Dr. Hoyt has used it with much success on many critical cases. Illustrated on page 12. Price \$1.60

Many instructors in science have been able to materially aid the surgeons of their locality in the practical use of the X-Rays. We solicit correspondence from them.

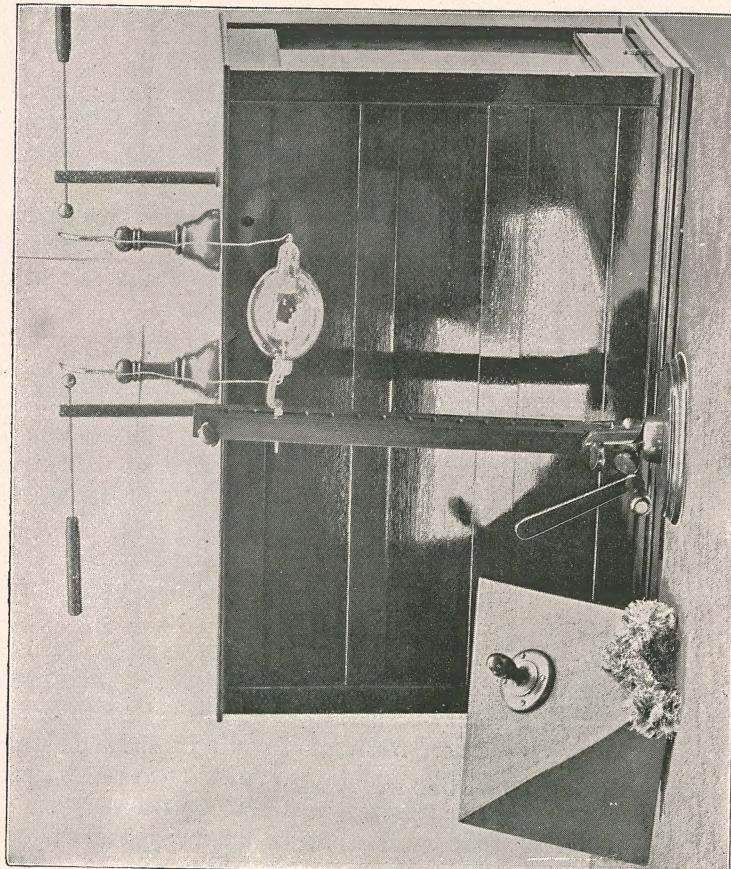
SLOAN PHYSICAL LABORATORY,

NEW HAVEN, CT., Jan. 14, 1897.

The Fluoroscope came in good order, and is very satisfactory.

Very truly yours,

(PROF.) ARTHUR W. WRIGHT.



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Fluoroscopes.

Since the issue of our former circular, the definition of our Fluoroscope has been greatly improved, and we have not seen any surpassing them in this respect.

807. Fluoroscope with screen 8x10 inches. Price . . . \$18.00

807a. Fluoroscope with screen 6x8 inches. Price . . . 12.00

808. Fluoroscope with screen 5x5 inches. Price . . . 6.00

809. Fluoroscope with screen 3x4 inches. Price . . . 4.25

826. Photographic Print; subject hand, showing the work of this machine, mailed on receipt of eighteen cents to cover the cost of production. This print is made as an illustration of the work of the Influence Machine. The price will be deducted from the first order of \$5.00 or more for X Ray material received after this issue.

827. Lantern Slide, similar to 826. Price . . . \$0.40

828. Lantern Slide; subject rat, as described on page 7.
Price \$0.40

829. Manual of X-Ray Manipulation, by W. J. Morton, M. D., written in a comprehensive, popular style, and treating the subject in an elementary manner. Contents: Description of Coils and Machines, Tubes and Methods. 100 Illustrations. Price \$0.75
Postpaid 0.85

830. Manual of X-Rays, by Prof. Thompson. A compilation of the reports of experiments in their succession, showing the study of the discharge tube as it has progressed to the present date. A scientific collection of most value to the student and lecturer. Price \$1.50
Postpaid 1.60

Combination Sets of Apparatus.

The following combinations are well adapted for use in surgery, lecture or scientific work. We have found them to be the usual combination ordered.

Set for Hand Power.

831. L. E. Knott Apparatus Co.'s High Grade Influence Machine No. 821. Price \$75.00

One Fluoroscope, No. 807a. Price 12.00

Two X-Ray Tubes, No. 804a. Price 16.00

One Support for Tubes, No. 825. Price 1.60

Total price \$104.60

Full directions are furnished with each apparatus.

Set for Direct Current Motive Power.

832. L. E. Knott Apparatus Co.'s High Grade Influence Machine, No. 822. Price	\$105.00
One Fluoroscope, No. 807a. Price	12.00
Two X-Ray Tubes, No. 804a. Price	16.00
One Support for Tubes, No. 825. Price	1.60
Total price	\$134.60

Set for Alternating Motive Power.

833. L. E. Knott Apparatus Co.'s High Grade Influence Machine, No. 823. Price	\$115.00
One Fluoroscope, No. 807a. Price	12.00
Two X-Ray Tubes, No. 804a. Price	16.00
One Support for Tubes, No. 825. Price	1.60
Total price	\$144.60

Set for Water Power.

834. L. E. Knott Apparatus Co.'s High Grade Influence Machine, No. 824. Price	\$95.00
One Fluoroscope, No. 807a. Price	12.00
Two X-Ray Tubes, No. 804a. Price	16.00
One Support for Tubes, No. 825. Price	1.60
Total price	\$124.60

MASSACHUSETTS HOMEOPATHIC HOSPITAL, BOSTON.

The tube I obtained from you is giving excellent satisfaction. We obtained a good negative of the Thorax (adult) today with only one and one-half minute's exposure.

Yours, F. F. STRONG,
Boston University School of Medicine.

X-Ray Plates.

The following plates are made with one extra thick coating, small amount of silver, and are individually wrapped light-proof.

They will give a dense negative, and are far superior to Photographic Plates.

One Dozen in a Box.

835. Size 5 x 8 inches.	Per dozen	\$1.50
836. Size 6½ x 8½ inches.	" "	2.00
837. Size 8 x 10 inches.	" "	2.90

Other sizes to order.

838. Special Developer.	Price	0.75
Full directions with each order.		

CATALOGUES.

We publish the following lists, and will be pleased to send copies on application:—

No. 36. NATIONAL PHYSICS COURSE. (*In press.*)

An innovation in scientific catalogues, embracing the course, with comments, as recommended by the "Committee of Ten." Illustrated with Half-Tone Engravings.

C. A CATALOGUE OF CHEMICAL APPARATUS.

A complete list of fine apparatus for Secondary School Laboratory Work in Chemistry.

M. A CATALOGUE OF MICROSCOPES AND APPARATUS

For Laboratory and Biological Work, embracing the best lines of Microscopes and Accessories.

X. APPARATUS AND METHODS

For the Practical Use of the X-Rays.

We solicit correspondence with Educational Institutions.



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